



## Explosion risk in aircraft maintenance hangars

**E**quipment designed for use in potentially explosive environments is often thought to be principally destined for oil and gas industry facilities, such as refineries and production platforms. In reality, there is a wide range of industries that need such equipment and the aviation sector is a prime example.

This article from Italian hazardous area equipment specialist Cortem provides an overview of the principal areas of explosion risk in aircraft hangars during maintenance operations.

Modern passenger and cargo aircraft are highly technologically advanced, are built from a range of different materials and are packed with many different types of equipment. Near-constant cycles of use, pressurisation and depressurisation and other wear and tear from exposure to extreme environments in the air and on the ground means they need regular maintenance.

This usually takes place in hangars at airports, and the protection of staff working in these structures requires an in-depth analysis of the different activities that have to be carried out as part of the maintenance programme.

Stringent regulations stipulate the types of ordinary and extraordinary maintenance to be carried out at which intervals for each type of aircraft, based on the number of flight hours and other considerations.

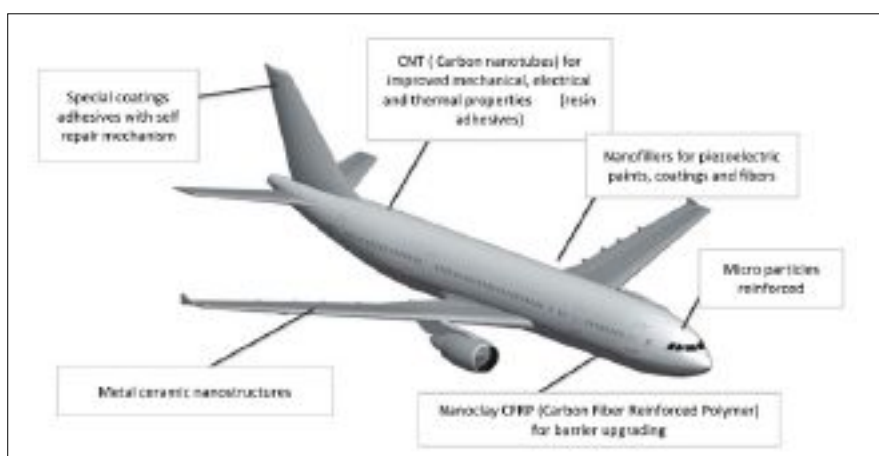
### Maintenance activities

Ordinary maintenance refers to all those activities that are carried out every day for the maintenance of the aircraft such as internal and external cleaning, and the verification of system functionality for on-board equipment.

Extraordinary maintenance refers to all those activities that must be performed to comply with mandatory safety regulations, such as checks on the wear of parts subject to stress and their replacement, if necessary.

Within the hangar, maintenance operations carried out may include disassembly and reassembly of equipment that can then be transferred to mechanical maintenance workshops, the stripping of all external parts subject to wear, integrity checks on their structure and subsequent repainting.

Separate parts of the skin of the aircraft are exposed to different types of abrasion, so the coatings applied offer different resistance characteristics.



Some coating types on a modern airliner

Before proceeding with paint stripping, all the unpainted parts are protected by masking. The stripping activity is performed using solvents suitable for the type of paint present, and precautions need to be taken to safeguard staff from the vapours generated by these solvents.

The structure of the aircraft is returned to its initial state with the aluminium alloy skin rendered totally free of paint, after which it is repainted in the airline's specific colour scheme.

### Electrical equipment for use in maintenance hangars

These hangars must be considered areas where there is risk of explosion due to the use and/or storage of chemical solvents and paints necessary for these activities. Paint removal with solvents can create explosive vapours and dust clouds can be generated by the removal of paint by mechanical means.

It is therefore necessary to classify the environment for explosion risk taking into account the chemicals used, the presence of flammable substances and combustible dusts in the atmosphere, as well as the ventilation present. From the analysis of



Some of the explosion proof equipment needed inside a maintenance hangar

these elements, zoning can take place and the relevant precautions taken.

An evaluation of ventilation is of fundamental importance, as where this can guarantee sufficiently low levels of vapour or dust particles, a downgrading of the zones is allowed, which can mean a wider range of maintenance equipment can be used.

Once the explosion risk and other dangers have been identified in each area, it is possible to determine and choose the 'Ex' electrical systems and equipment. These should include:

- Lighting equipment for distributed lighting
- Lighting equipment for concentrated lighting (floodlights)
- Sockets and plugs suitable for connection

and disconnection in a hazardous area

- Light distribution and switchboards
- Earthing systems with equipotential verification and consent to switch on electrical equipment such as extraction pumps
- Ventilation and air extraction systems
- Equipment connection accessories ■

#### About the company

**Cortem Group** has been designing and manufacturing electrical equipment for hazardous areas since 1968. Thanks to continuous technical innovation it is today a leader in the Ex field, and can provide a whole range of products to meet all onshore and offshore applications.



Reapplying paint